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Potential PCBs in Venting Gas from Kalamazoo Superfund Site Landfills

PCB emissions from the Kalamazoo River Superfund site landfills were carefully studied before any remediation work was started, and the emissions were found not to present health risks at that time. In addition, engineered cover systems, such as those installed at the King Highway landfill and under construction at the Willow Boulevard/A-site Operable Unit, are effective in mitigating any potential PCB emissions ⁽¹⁾.

Extensive Air Emission Monitoring

In 1993, ambient air monitoring for PCB emissions from the Willow Boulevard site was conducted as part of the Superfund Remedial Investigation ⁽²⁾. At the time of the monitoring, the surface of the 11-acre Willow Boulevard site had an average PCB concentration of 68 mg/kg in the soil. The monitored levels of PCBs in air were in compliance with Michigan's Air Regulations: Rules of Act 348 of 1965 before the landfill was covered ^(2, 3). In addition, as part of its review the Michigan Department of Environmental Quality analyzed the data from the monitoring location that showed the highest PCB concentrations and concluded that a long-term resident exposed to those levels at that location would experience an added risk of cancer risk of one in one million or less ⁽³⁾.

The same type of investigation conducted in 1993 on the un-remediated Allied Paper, Inc. Operable Unit reached the same conclusions ⁽⁴⁾.

Protective Engineered Cover System

Covers of the type being placed on papermaking-residual landfills in the Kalamazoo River Superfund site eliminate the air/soil exchange pathway that would have been the source of the vast majority of PCB emissions before the landfills were closed. These cover systems also address the potential of PCBs being released with the gas produced by the decomposition of the papermaking residuals ⁽⁵⁾, because the sand-filled gas-venting layer that collects the landfill gas adsorbs vapor-phase PCBs ⁽⁶⁾. Although PCBs might be measureable in the venting gas -- just as they are in background air ^(2, 4) -- these emissions would be just a small fraction of the air emissions coming off the landfills prior to remediation, which were found to comply with state air regulations and not present a risk to human health.

In fact, the USEPA conducted a study of PCB emissions from a capped PCB landfill and concluded that the emissions from a monitored landfill vent that extended through the engineered cap into the PCB waste were "negligible" ⁽¹⁾.

Notes and References:

1. Lewis, R.G., Martin, B.E., Sgnotz, D.L. and Howes, J.E. "Measurement of Fugitive Atmospheric Emissions of Polychlorinated biphenyls from hazardous waste landfills" ES&T Volume 19 No. 10 1985
2. Blasland, Bouck & Lee, Inc., Technical Memorandum 5 - Willow Boulevard/A-Site Operable Unit Results of the Air Investigation, (Syracuse, NY: February 1994).

3. Cornelius, S.D., MDNR to M.P. Brown, Blasland, Bouck & Lee, Inc., Letter transmitting conditional approval, comments, and insertions for Technical Memorandum 5 - Willow Boulevard/A-Site Operable Unit Results of the Air Investigation, (April 8, 1994).
4. Blasland, Bouck & Lee, Inc. Allied Paper, Inc. Operable Unit Technical Memorandum 4 - Results of the Air Investigation. (Syracuse, NY: February 1994).
5. Paper making waste is essentially a mixture of cellulosic fibers and clay particles, which is relatively inert and produces lower levels of gas from decomposition as compared to other waste such as municipal solid waste.
6. Sand, especially dry sand, is a good absorbent for vapor-phase PCB; Florisil, which is a standard absorbent used for air sampling is essentially a sand comprised of 85 percent SiO₂ (see Erickson, Mitchell D. Analytical Chemistry of PCBs 2nd Edition CRC Press LLC. 1997).